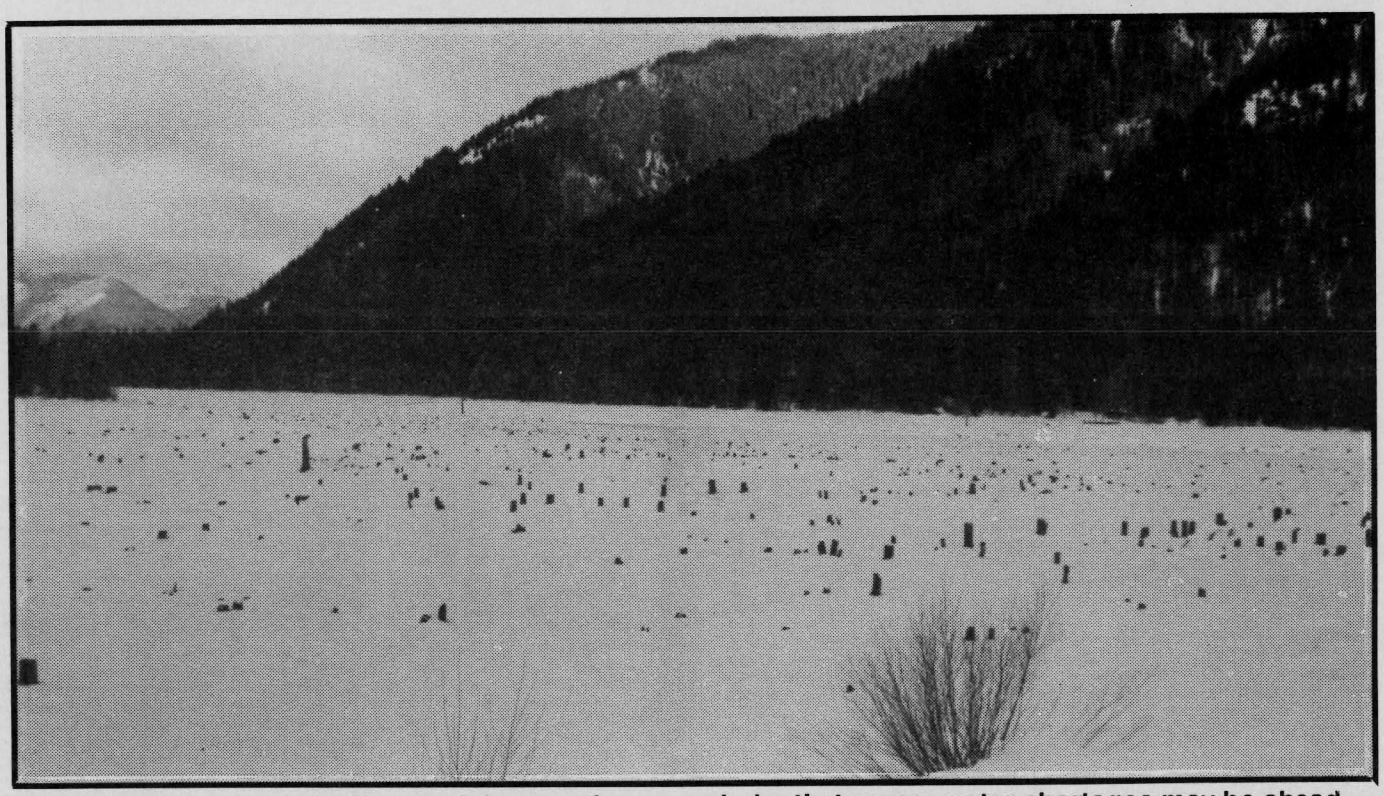
YAKIMA BASIN RESOURCE NEWS

Washington Sea Grant Program *March 1988*



The empty Bumping Lake Reservoir is an ominous reminder that severe water shortages may be ahead.

1988 Water Supply Forecast Looks Grim

If current trends continue, the Yakima Basin appears headed for serious, perhaps record, water shortages in 1988. As of February 9, reservoir content in the five major storage reservoirs was only 161,000 acre/feet or 15% of capacity. This compares with 364,000 acre/feet on the same date in 1987, 446,000 acre/feet in 1986 and 503,000 acre/feet in 1985.

Snow levels in the basin, as measured at various survey points, are 80% of normal, while precipitation since October 1, 1987 is 69% of normal..

Last year was a water-short year, with deliveries of water to some junior or pro-ratable water uses curtailed a month or more ahead of normal. The Roza Irrigation District, Kittitas Reclamation District and the Wapato Irrigation Project "B" lands were affected by early cutoff of irrigation water deliveries. At the end of the 1987 irrigation season, storage reservoirs were at near-record low levels. This very low carryover of water contributed to the current low reservoir content.

Fisheries managers are also greatly concerned with the low water supply. Adult and juvenile migration, juvenile rearing and spawning and incubation can all be adversely impacted by insufficient instream supplies. This is particularly true in the Yakima Basin, where even in good water years, instream flow problems exist. The spectre of very low water supplies makes fisheries management extremely difficult in the Yakima Basin.

The Bureau of Reclamation will issue its first official 1988 water supply forecast for the Yakima Basin during the first week of March. Meanwhile, farmers, fishermen, resource managers and other can only look to the west and hope for raincloud on the horizon.

Yakima/Klickitat Production Project

By **Thomas J. Clune**
Yakima Basin Project Manager
Bonneville Power Administration

In 1980, the United States Congress passed Public Law 96-501, the Pacific Northwest Electric Power Planning and Conservation Act, which brought the Bonneville Power Administration (BPA), on behalf of the electric ratepayers of the Pacific Northwest, to the forefront of fish and wildlife protection, mitigation and enhancement efforts in the region. The Northwest Power Act also created the Northwest Power Planning Council, which was charged with developing a plan by which fish and wildlife improvements were to be accomplished. The plan became the Columbia River Basin Fish and Wildlife Program, published in 1982 and amended in 1984 and 1987.

Pursuant to the Columbia River Basin Fish and Wildlife Program, BPA is presently conducting the preliminary design for a Yakima/Klickitat salmon and steelhead production facility, hereafter referred to as Yakima Hatchery. The purpose of the hatchery project is to evaluate whether artificial or hatchery production can be used to increase harvest and enhance the natural production of salmon and steelhead. The evaluation of supplementation and the employment of adaptive management methods will be needed to accomplish this purpose.

The scope of the preliminary design process presents a challenge for all parties involved in the project. In addition to the preliminary engineering, environmental analysis, cost estimates, permits and other required elements, the following tasks will be included:

Coordination with affected parties: BPA and others on the hatchery technical work group will actively seek public input on the predesign process. BPA will work with all interested parties to develop a hatchery program that will not adversely affect existing water rights and is consistent with the intent of the Fish and Wildlife Program. BPA will be meeting with irrigation and water enhancement planners, system and production planners, hatchery and harvest managers, ratepayer groups, sport fishing groups, technical research groups and others.

Refinement of project production goals, development of a harvest plan and an assessment of genetic risks: BPA will work with state fishery agencies and Yakima Nation to obtain these products.

A technical analysis of water supplies: The purpose of this task is two-fold; first to analyze the available water supplies for spawning, incubation, rearing and migration in the natural environment. A critical part of this task is to identify areas where agreements with water users will be required and to take the coordination steps necessary to discuss such agreements. The second purpose of this task is to provide an analysis of water supplies at proposed hatchery sites.

A project experimental design: The experimental framework for the project is required to test the stated supplementation questions and to feed back the results into the adaptive management process. The development of the experimental design must take into account conflicting water uses in the basin and accommodate areas where agreements with irrigation and other water users are essential.

In November 1987, BPA formed a hatchery technical work group consisting of representatives of irrigation districts, U.S. Bureau of Reclamation, federal and state fishery agencies, the Yakima Nation and the Power Planning Council. This group has been providing technical input on the proposed project and has attempted to very carefully balance the interests of <u>all</u> affected parties. The technical work group will continue to work for cost effective fishery improvements within the framework of existing water uses.

The preliminary design report is scheduled to be completed by April 1990. At that time, BPA will submit the report for Power Planning Council review. Upon approval of the predesign effort, BPA will proceed with final design and construction of the hatchery project.

The most challenging task before us is the development of a good working relationship with all affected parties. It is becoming increasingly evident that more time and energy must be dedicated to working with irrigation and fishery groups to accomplish the hatchery project objectives; while not adversely affecting the existing water rights of the agricultural community. If this cooperative effort is to succeed, we must keep the lines of communication open and attempt to find solutions to the problems before us.

BPA will be pleased to respond to your inquiries and provide any information we may have on the subject. Please contact:

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Policy Group Discusses Basin Legislation

The Policy Group met recently in Seattle to consider the future efforts to gain passage of legislation dealing with water supply problems in the Yakima Basin.

Formed in early 1987, the Policy Group guides drafting and consideration of Congressional legislation dealing with water supply problems in the Yakima Basin. The Group is composed of Senators Dan Evans and Brock Adams; Representative Sid Morrison; Andrea Riniker, Director of the Department of Ecology; Dr. Alan Pettibone, Director of the Department of Agriculture; and Mel Sampson, Chairman of the Yakima Tribal Council.

During the meeting, they received final reports from four technical work groups that were charged with reviewing and analyzing pertinent technical data and making recommendations relating to pending legislation (SB 1435, HB 2814) that was introduced in June 1987.

Much of the discussion centered on the need for major additional storage. A proposed reservoir on Cabin Creek near Easton had been added to the legislation last year. However, further analysis by the Off-Reservation Storage Site Selection Work Group indicated that the cost of this project would be unduly high, because of unfavorable geologic conditions. Based on this information, the Policy Group agreed to remove the Cabin Creek project from the legislation.

The Group also discussed the addition of Bumping Lake Enlargement to the legislation. This project, which has been the subject of studies for over four decades, would increase storage at Bumping Lake from the current 33,700 acre/feet to over 400,000 acre/feet. Sampson and Ron Van Gundy, manager of the Roza Irrigation District, both expressed strong support for this project. In addition, both the Off-Reservation Storage Site Selection and Instream Flow Work Groups recommended adding this project to the legislation.

Opposition to the project was expressed by representatives of the environmental community. Dave Ortman, northwest representative of Friends of the Earth, recommended that an aggressive water conservation program be implemented and evaluated prior to consideration of additional storage. Environmental concerns, according to Ortman, include inundation of old-growth timber and the proximity of the project to designated wilderness areas.

After further review and discussion, the Policy Group decided on a two-phase approach: push ahead with the original Early Implementation Legislation, minus Cabin Creek; and attempt to forge a total package that would include expanded storage, new storage on the Yakima Indian Reservation and a water conservation program.

Elements of the Early Implementation Legislation include:

1. Improvements to the Wapato Irrigation Project.
2. Improvements to the Sunnyside Valley Irrigation District.
3. Construction of a pipeline between Keechelus and Kachess Reservoirs.
4. Subordination of power production at Roza, Chandler and Wapatox powerplants.
5. Raising the height of Cle Elum Dam by 3 feet.
6. Construction of a reregulating reservoir on the Roza Irrigation District.

It remains to be seen how rapidly this legislation can move through Congress during a year when its members may be caught up with campaigns and elections.

WASHINGTON SEA GRANT

Resource News

Yakima Basin Resource News is a quarterly publication of the Columbia/Snake River Office of the Washington Sea Grant Program. A consortium with representatives from Washington State University, the Univerity of Washington, Oregon State University and the University of Idaho administers the regional program, which develops educational projects on Columbia River Basin resources.

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Yakima Basin Resource News reserves the right to edit articles for clarity and length. Suggestions, encouragement and criticisms from the readers are welcomed. Address correspondence to Washington Sea Grant, 1919 NE 78th St., Vancouver, WA 98665.

Yakima Sub-Basin Planning Outlined

By **Bruce Watson and David Lind**
Fisheries Biologists
Yakima Indian Nation

The written accounts of early settlers convey a sense of awe at the numbers and size of salmon and steelhead returning from the sea to their spawning sites in the Columbia River Basin. Over the last century and a half, however, this once-unfathomable resource has been depleted by overfishing, agricultural and hydropower development, and habitat degradation.

With the passage of the Northwest Power Act of 1980, the U.S. Congress focused attention on this problem. Millions of dollars had already been spent to mitigate salmon and steelhead losses attributable to hydropower but it was not enough. The Northwest Power Planning Council, created by the Act, estimates that the Columbia Basin has sustained an annual loss of between 7 and 14 million salmon from a variety of causes. The Council recently set a goal of doubling the current annual run size of 2.5 million fish to compensate for part of this loss.

To achieve this goal, the Council developed a process called "system planning." For planning purposes, the vast Columbia Basin has been divided into a network of 31 sub-basins, one of which is comprised of the Yakima River and its tributaries. Over the next year and a half, each of the 31 sub-basins, including the Yakima, will be the subject of intensive study by a team of sub-basin planners. The team members are employees of tribal, state and federal resource management agencies, working under contract to the Power Planning Council. Sub-basin planners will use study results to propose alternatives for how each sub-basin can best contribute to the overall goal of doubling the salmon and steelhead runs.

Rebuilding the fish runs will require improvements in three areas: 1) fish production by natural and artificial means, 2) mainstem and tributary fish passage facilities, and 3) management of fish harvests, both in the basin and in the ocean. Sub-basin planning teams must work closely with the overall system planning group in order to devise solutions that are based on local expertise and also fit a basin-wide plan.

In the Yakima sub-basin, the planning process has been underway since September 1987. The Yakima Indian Nation (YIN) has the role of lead writer for the Yakima sub-basin plan. YIN planners are currently finishing a preliminary report which contains the best available information on the status of salmon and steelhead stocks in the sub-basin. (Time constraints preclude field research, thus requiring work with existing information.) Particular attention has been paid to data composition, harvest, natural production and hatchery planting.

Yakima sub-basin planners are also working on a method for estimating the potential natural production of each stock in the sub-basin under the present physical constraints. This preliminary information is needed from each sub-basin to allow system planners to run a basin-wide fishery planning model. This model will help identify the most promising enhancement measures, as well as identify the areas where better data are needed.

The next phase of the sub-basin planning process is to develop a sub-basin plan that proposes alternative strategies for increasing anadromous fish production. There will be a high level of public involvement in this phase of the process; technical sessions and public meetings will provide all interested parties the chance to contribute to the sub-basin plan.

From the perspective of planning, the Yakima sub-basin is unique in at least two respects. First, compared to other basins, much more is known about the native spring chinook stock. The Yakima River Spring Chinook Enhancement Study, which began in 1982 and will continue through 1990, generated much of this information, and a substantial amount of information on other stocks as well.

Second, there are two other major projects in the Yakima sub-basin that have common goals with the sub-basin planning effort: the Yakima River Basin Water Enhancement Project (YRBWEP) and the Yakima/Klickitat hatchery project.

Under YRBWEP, work is currently underway to improve anadromous fish passage and water availability in the Yakima sub-basin. The proposed Yakima/Klickitat hatchery will further enhance fish runs by supplementing natural production with spring chinook, fall chinook and steelhead. Hopefully, the adverse genetic impact of hatchery releases observed in other basins will be avoided here, as native Yakima Basin runs will provide broodstock, and the genetic integrity of succeeding generations will be intensively monitored.

Plans are also underway to utilize this facility for the attempted reestablishment of a run of summer chinook and sockeye; and to rear and release coho smolts with the intention of establishing a substantial coho fishery in the Yakima Basin.

The location and number of Yakima Basin tributaries that will receive releases of hatchery coho and steelhead will depend upon the results of a study of the impact of hatchery coho and steelhead on the growth, survival and distribution of resident rainbow populations.

*See **Sub-basin**, page 5*

Sub-Basin... from page 4

The hatchery project and YRBWEP will address the greatest obstacles to restoring healthy runs of anadromous stocks in the Yakima sub-basin, and will be the primary mechanisms through which sub-basin planning goals will be realized. The efforts of sub-basin planners and the members of the YRBWEP and hatchery teams will, of necessity, be closely coordinated.

The sub-basin planning effort proceeds through five phases: sub-basin preliminary information reports, draft sub-basin plans, system analysis of sub-basin plans, revision of sub-basin plans and an integrated system plan for the entire Columbia Basin. The preliminary information report for Yakima Basin will be finished in March 1988. At that time, the Power Council's system planning group will have analyzed the data and identified opportunities and constraints unique to the Yakima Basin.

The drafting of a preliminary sub-basin plan will continue through August 1988. During this time, a list of fishery enhancement goals and alternative implementation strategies will be developed. Many of these goals and strategies will be jointly developed by members of the sub-basin planning team and the Yakima/Klickitat hatchery team.

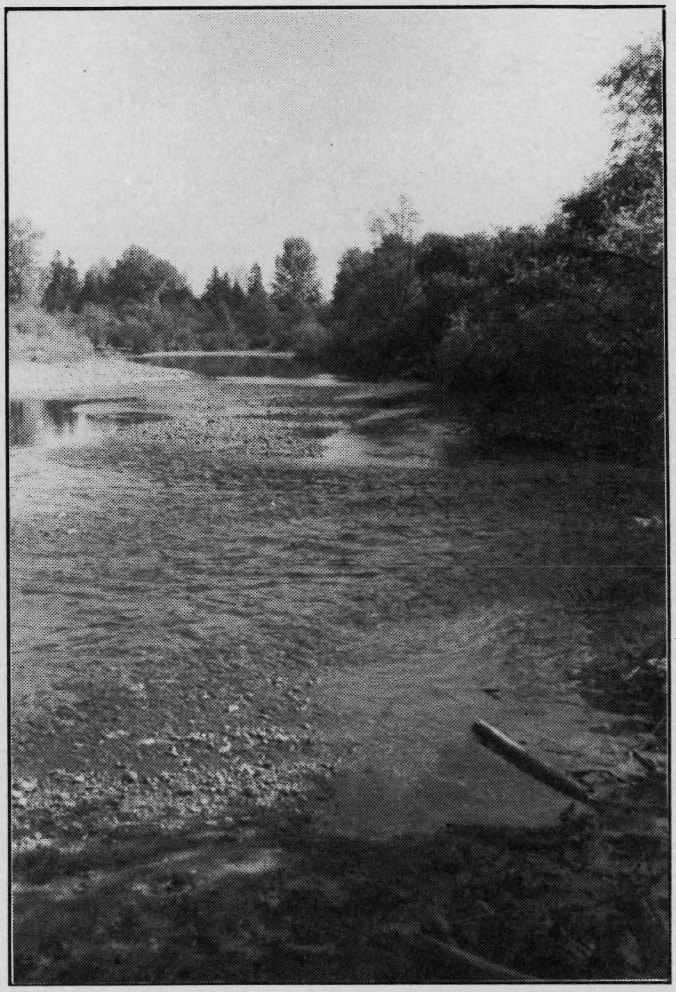
The system planning group will then analyze the draft sub-basin plan from August through November 1988. They will attempt to ensure that the plan does not conflict with the plans of other sub-basins or entail unwarranted genetic risks to native stocks. They will also determine whether the plan is consistent with the production characteristics of the Yakima Basin, the expected Columbia River and ocean harvests, and the anticipated losses attributable to mainstem dam passage.

Informed by the system planners' analysis, Yakima sub-basin planners will revise their plan over the period from December 1988 through February 1989. This revision will consist mainly of a newly prioritized list of projects designed to realize preferred goals.

An integrated system plan for the entire Columbia Basin will be developed between September 1989 and March 1990. This plan will be presented to all of the affected fisheries agencies and tribes. If approved, the plan would then be amended into the Northwest Power Planning Council's Fish and Wildlife Program.

There will be approximately seven opportunities for public involvement in the development of a fisheries management plan for the Yakima Basin. Three will take the form of large, formal presentations with discussion periods; and four will consist of informal, monthly work sessions.

Although the precise time and place of the formal presentations have not yet been determined, they will occur approximately during April 1988, in August 1988 and in February 1989. The themes of these presentations will be, respectively, the content and implications of the preliminary information report; the major enhancement goals and implementation strategies for the Yakima Basin; and the final, revised fishery enhancement plan for the Yakima Basin. These presentations will last all day, with the morning hours allocated to governmental and corporate interests, and the afternoon dedicated to the general public.



Spring chinook habitat in the upper Yakima.

The workshops will occur monthly, from April through July (or more frequently if necessary), and will probably be held in Yakima on Saturday. The workshops will be open to the public. Members of the Yakima sub-basin team will discuss current issues and problems that will focus primarily on the setting of enhancement goals and will encourage comments and suggestions from all attendees. Hopefully, these workshops will generate novel solutions to local problems and will provide mutual education.

Spring Chinook Enhancement Study

By **David E. Fast**
Fisheries Biologist
Yakima Indian Nation

The population of Yakima River spring chinook salmon (Oncorhynchus tshawytscha) has been drastically reduced from historic levels, reported to be as high as 250,000 by some sources. This reduction is the result of a series of problems including: dams within the Yakima Basin, severely reduced flows due to irrigation diversions, sediment loading and overfishing. In the face of these adversities, the spring chinook run in the Yakima Basin reached a low of fewer than 2,000 fish in 1979.

In October 1982, the Bonneville Power Administration contracted with the Yakima Indian Nation to develop methods to increase production of spring chinook in the Yakima System. The Yakima Nation's current enhancement policy attempts to maintain the genetic integrity of the spring chinook stock native to the Yakima Basin. Relatively small numbers of hatchery fish have been released into the basin in past years. Return rates from the current Yakima study smolt releases are 0.07%. These low return rates indicate that few fish would have returned form these early hatchery releases. Thus, the genetic input form hatchery fish into Yakima Basin stocks is probably negligible.

The goal of this study is to develop data that will be used to present management alternatives for Yakima Basin spring chinook. The study has five major objectives.

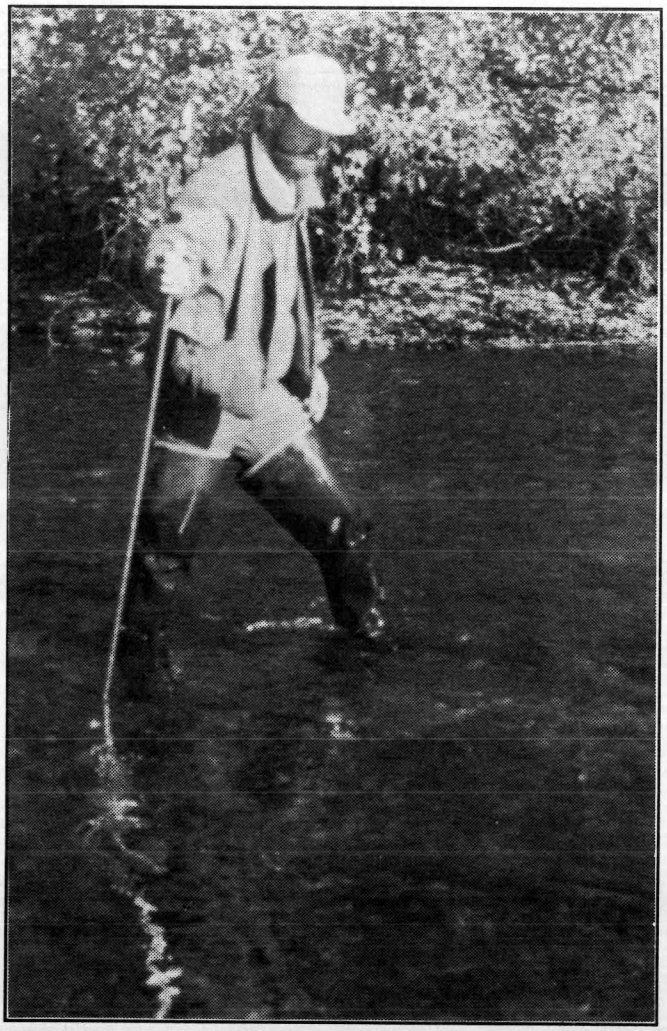
1. **Determine the distribution, abundance and survival of wild Yakima Basin spring chinook.** Naturally produced populations are being studied to determine if these runs can be sustained in the face of present harvest and environmental conditions. Survival through each life stage is being evaluated in an attempt to determine limitations to natural production in the basin. Survival to emergence studies are being conducted to determine survival through the incubation stage. Analysis of the relationship between survival to emergence and gravel substrate quality is being undertaken. Seining at selected sites and electroshocking surveys have been conducted to evaluate distribution and abundance of juvenile fish. Smolt outmigrations are monitored at the Wapatox juvenile trap on the Naches River and at the Prosser juvenile trap on the mainstem Yakima River. Adult returns are determined by monitoring the Yakima Tribal dipnet fishery, counting adults at Prosser and Roza fish ladders and through spawning ground surveys. Physical parameters such as water temperatures and stream flow are monitored throughout the basin.

2. **Determine the relative effectiveness of different methods of hatchery supplementation.** This objective is divided into three subobjectives:

   a) Determination of optimal release time. Smolt releases are the norm, but fingerlings were released in June, September and November of 1984 and 1985. Downstream survival of these smolts will be evaluated and adult returns will be monitored.

   b) Determination of optimal manner of release. In the past, fish have either been transported from a hatchery and released into the Yakima River or raised in rearing ponds. These methods, as well as the use of acclimation ponds, will be evaluated.

*see **Enhancement** , page 7*



Spring chinook spawning survey.

Enhancement ...from page 6

c) Determination of optimal release stocks. Smolts will be released as hatchery X hatchery, hatchery X wild and wild X wild crosses to determine the effect of genetic make-up on the sucess of various releases. Success will be measured as the number of adults returning, as well as whether spawning timing is similar to the wild stock.

Adverse interactions between hatchery releases and wild stocks will be minimized by scatter-planting hatchery fish so densities in the river will remain low enough to minimize competition for food and space.

3. **Locate and define areas in the watershed that may be used for the rearing of spring chinook.**

4. **Define strategies for enhancing natural production of spring chinook in the Yakima Basin.**

5. **Determine the physical and biological limitation on production within the basin.**

These objectives will be met at the end of the study when the database is complete. At the conclusion of this study, a series of alternatives will be developed that can be used to determine how best to enhance the runs of spring chinook in the Yakima Basin.

A SUMMARY OF THE 1987 RESULTS OF THE SPRING CHINOOK STUDY

The smolt outmigration was monitored at Wapatox Canal on the Naches River and at Chandler Canal on the lower Yakima River. The spring outmigration at Wapatox was estimated to be 16,141 smolts. The total 1987 spring outmigration of wild spring chinook from the Yakima Basin was estimated to be 251,975 smolts.

The survival from egg to smolt was calculated using the 1985 redd counts and the total 1987 smolt outmigration. Using this data, the estimated survival was 4.16%. The mean egg to smolt survival for the years 1984-1987 is 6.32%.

In 1987, a total of 3,683 adult and 335 jack spring chinook salmon were counted at the Prosser counting station. (Jacks are male salmon that have only spent one year in the ocean, instead of the normal two or three. They therefore tend to be smaller than adult salmon, but they are sexually mature.) The median dates of passage at Prosser Dam were May 12 and May 16 for adults and jacks, respectively. An additional 372 spring chinook were estimated to have been caught in the Yakima Tribal subsistence dipnet fishery below Prosser Dam. Therefore, the total return of spring chinook to the Yakima System in 1987 was 4,390.

"From this information, it is apparent that the wild population is a very important component of the Yakima Basin spring chinook run."

Spring chinook were counted at Roza Dam from May 1 to September 30, 1987. Passage at Roza Dam was 1,610 adult and 67 jack spring chinook for a total of 1,677 wild fish. The median dates of passage at Roza Dam were May 29 and May 26 for spring chinook adults and jacks,zx respectively.

The smolt to adult survival was calculated based on the 1983 smolt outmigration estimated at Prosser and the 1984 return of jacks (three-year-old fish), the 1985 return of four-year-old adults and the 1986 return of five-year-old adults to the Yakima System. It was estimated at 6,012 wild three-, four- and five-year-old fish returned from an estimated smolt outmigration of 135,548 fish in 1983. This yields an estimated survival from smolt to adult of 4.8%.

The smolt to adult survival for the 1984 smolt outmigration was 5.3%, with 423 jacks returning in 1985, 5,163 four-year-old adults returning in 1986 and 983 five-year-old adults returning in 1987. This totals 6,569 jacks and adults from an estimated outmigration of 123,732 smolts in 1984.

Spring chinook adults from 14 different hatchery release groups were recovered in 1987. A total of 211 coded wire tags were recovered and these were expanded to an estimated 253 returning hatchery fish in 1987. Nine of these fish were jacks.

The survival of hatchery fish from smolt to adult ranged from 0.04% to 0.13%. This compares with the mean smolt to adult survival rate of 4.7% over the past three years for naturally producing (wild) spring chinook salmon in the Yakima System. From this information it is apparent that the wild population is a very important component of the Yakima Basin spring chinook run. The long range goal of the Yakima Indian Nation is to protect and increase this natural spawning population of spring chinook while further increasing harvest opportunities.

Copies of the annual report may be obtained by contacting the Fish and Wildlife Division of Bonneville Power Administration in Portland or by contacting the Yakima Tribal Fisheries Resource Management Program in Toppenish, telephone (509) 865-5121.

Development of Yakima Hatchery Production Profiles and Management Policies

By **Tom Scribner**
Fisheries Enhancement Biologist
Yakima Indian Nation

During the development of the Northwest Power Planning Council's (NPPC) Fish and Wildlife Program, the tribes and fishery agencies proposed several measures necessary for the restoration of the natural spawning runs of salmon and steelhead in the Columbia River Basin. They recognized the potential for accomplishing this task by using new and existing hatchery facilities through proper stock selection and release to areas of underutilized habitat.

The Yakima Indian Nation (YIN), with the support of the other agencies, proposed the construction of a Yakima Hatchery for this purpose. In 1982, the Power Council accepted recommendation of the tribes and fishery agencies and incorporated a hatchery measure in the Fish and Wildlife Program. The Council also included a condition that the hatchery would not be developed until the ocean harvest was controlled. During the 1984 amendment process, the Yakima Tribe documented that the efforts to control ocean harvests had been successful and the measure should proceed.

As a result, the Council included Measure 704 (i) (3) which states that: "Bonneville shall fund design, construction, operation and maintenance of a hatchery to enhance the fishery for the Yakima Indian Nation as well as other harvesters. The Hatchery will be a central outplanting facility, used to raise juvenile fish for release in the Yakima Basin and elsewhere in the Columbia River Basin. The purpose of the hatchery will be to supplement natural runs." The measure also anticipates using facility production not only for the Yakima River but in other tributaries within the Columbia River basin to increase natural runs. Initially, production is also proposed for the Klickitat River basin.

The Yakima Central Outplanting Facility Master Plan process under the guidance of the NPPC was the first step toward development of this facility. Through an Intergovernmental Agreement (IGA) with the NPPC, the YIN was a major participant in the Master Plan development of this important facility. As part of the IGA, the YIN was responsible for developing coordinated production profiles and management policies regarding the proposed Yakima Hatchery as well as specifiying release sites and strategies. Though the lead agency in these tasks was the YIN, other fisheries agencies and interest groups reviewed the project and their comments were incorporated.

*See **Development**, page 9*

Year ten production objectives under current flow conditions

	Spawners	Incubation # Eggs	# Smolts	Pounds	Expected Adult Production
Yakima River					
Spring chinook	960	1,651,200	1,073,280	71,522	2,146-5,366
Summer chinook[a]					
Fall chinook	1,050	3,575,000	3,003,000	33,367	6,006-15,014
Summer steelhead	150	303,000	197,438	28,205	5,924-9,872
Coho	2,350	2,679,000	2,009,250	133,950	2,213-5532
Sockeye[b]	1,475	1,475,000	1,106,250	73,750	2,213-5,532
Klickitat River					
Spring chinook	2.877	4,603,200	2,992,080	199,472	5,984-14,960
Summer steelhead	350	850,500	522,825	78,975	16,584-27,641

[a] Experimental program, continuation depends upon results.
[b] Sockeye hatchery enhancement contingent upon results of feasibility study.

Development... from page 8

A separate management policy/production strategy and corresponding release sites were summarized for individual species under current water flows in both the Yakima/ Klickitat basins. In addition, estimates were included for expanded production in the event that augmented flows are provided through the Yakima River Water Enhancement Project (YRWEP).

The stocks proposed for this facility include: spring chinook (Yakima and Klickitat Rivers), summer chinook (Yakima River), upriver bright fall chinook (Yakima River), early run coho (Yakima River), sockeye (Yakima River) and summer run steelhead (Yakima and Klickitat Rivers).

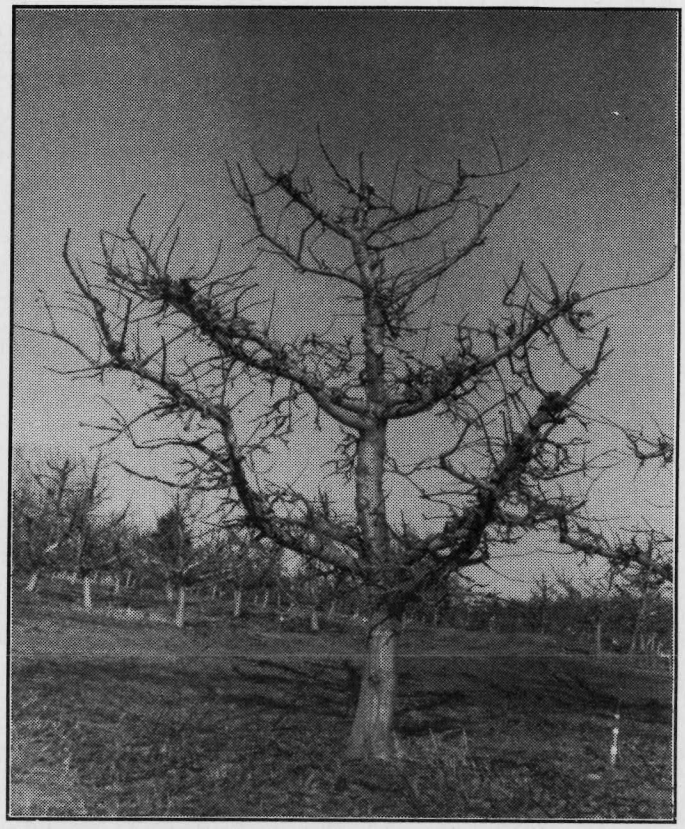
Planning for facility(ies) needs is based on a phased ten-year production implementation period beginning in the early 1990s upon completion of the hatchery. Escapement estimates are based upon a smolt to adult return rate of 0.002 to 0.005 for Oncorhynchus species and 0.03 to 0.05 for Salmo species (U.S. vs. Oregon data). It must be recognized that variations in escapement will occur due to species differences, dam passage survival, river basin release locations and harvest rates both in mixed sotck and terminal fisheries.

The YIN will continue to work with other tribes, fishery agencies and other interest groups to integrate all hatchery production within the Columbia Basin with the primary goals of increasing natural runs and providing both tribal and non-tribal harvest opportunities.

Because the primary intent of this measure is to utilize the hatchery facility(ies) to rear fish for release into natural production areas, such as supplementation, it will be necessary to develop an integrated system with a central facility(ies) and various types of satellite facilities. This production strategy is based on development of acclimation facilities and release techniques which allow for both volitional and nonvolitional releases.

Both permanent sites and portable facilities must be integrated to accomplish these objectives. Other efforts underway to determine Yakima River acclimation sites for fall chinook under the John Day mitigation program measure will be coordinated with this overall production and release plan.

An integral component of this measure will be the need for an intensive monitoring and evaluation program. The production profiles will have the flexibility to be modified as the results of the monitoring and evaluation program become available.



Pruning in the orchards and vineyards signals that spring is near.

Although not anticipated, genetic variations in natural stocks from hatchery influence may occur over a long period of time. Proper design and operation of the proposed Yakima Hatchery complex will help ensure that variations are minimal. Broodstock will be taken from stocks to be enhanced and their offspring will be released back to the natural production areas. Only 20-25% of a returning run will be used for broodstock in order to protect the genetic integrity of stocks that could be negatively impacted.

To evaluate the impacts of supplementation, it will be necessary to closely monitor both the hatchery and natural spawning components of the runs. Areas to be monitored will include adult and juvenile run timing, spawning time and its success, fecundity, age and sex composition. Current techniques such as marking with coded-wire tags will be employed. Harvest monitoring will be coordinated and integrated with other on-going efforts such as those used in the U.S./Canada and U.S. vs. Oregon processes.

Yakima Hatchery Production Project and its Implications for Agriculture

By **Walter Larrick**
Fisheries Biologist
Roza Irrigation District

The Yakima River Basin, since the beginning of its development for agriculture, has struggled with complex water rights issues associated with Indian treaty rights, beneficial use, natural flow and storage, riparian and appropriated rights. The focus is on the quantity of water and its economic and cultural importance to those who have the right to use it. This water has enabled the development of one of the most productive agricultural resources in the state and the nation--the Yakima River Basin.

Prior to the establishment of the agricultural and industrial resources of the Northwest, there existed a very productive fishery resource associated with the naturally occurring river systems. As the state and the Northwest developed their abilities to control the natural water courses and modernize harvest techniques, the fishery resource suffered and declined from its historic levels. The habitat that once supported the fishery resource in the past in the Yakima River Basin is still intact and available for fishery production in the future. For this reason, the Northwest Power Planning Council has put an emphasis on the Yakima River Basin as an off-site enhancement area, with a high priority in the Council's Fish and Wildlife Program.

The concept of the Northwest Power Planning Council's Program for the Yakima River Basin is to take advantage of the available habitat for fish production to contribute to the rebuilding of the fishery resource of the Columbia River Basin.

The rebuilding of the salmon and steelhead runs in the Yakima River is a process which has already started through water management for transportation, spawning, incubation, construction of new passage facilities and controls over harvest. The hatchery project is a tool to expedite and manage that process and evaluate the results. The planning stage of this hatchery project, which has just started, needs to quantify the fishery resource in numbers of fish and habitat that will need to be maintained and managed. Once this is accomplished, the water needed to maintain that fishery resource can also be quantified and a determination made of how that water need will affect existing use and what possible solutions there are to any conflicts that may occur.

The Yakima Hatchery Production Project, in conceptual form, is being designed to rehabilitate existing runs of salmon and steelhead, reestablish certain runs of salmon and steelhead into areas they no longer utilize and produce hatchery production for harvest. This project has been termed an experiment to address complex biological questions associated with the interactions between hatchery production and naturally producing populations.

Along with the experimentation to address the biological concerns of the hatchery, there needs to be focus and attention on the overall experiment to address the complex water issues associated with maximizing the number of salmon and steelhead that can be produced naturally in the basin while maintaining existing agricultural production. These two valuable resources should not, and need not, be mutually exclusive of each other. There must be commitment by both agricultural and fisheries entities to work together to resolve potential conflicts in achieving certain desired conditions for each resource.

"...Can the fishery resource be rehabilitated without imposing significant constraints to the agricultural resource within the Basin?"

Over the next two years, Bonneville Power Administration will direct and manage a technical work group to accomplish a pre-design study of the hatchery. This group will address the issues associated with water use and increasing naturally producing salmon and steelhead. The agricultural community must become and stay involved in the management and policy decisions that will be made concerning the development of the fishery resource in the Yakima River Basin.

The issue is over water and how and when that water will be used in the Basin. The question that needs to be addressed in great detail is, "Can the fishery resource be rehabilitated without imposing significant constraints to the agricultural resource within the Basin?" The development of the fishery resource has the potential to change the existing use of the water and the present management system in existence today.

That change could be detrimental to the agricultural resource or that change could be the mechanism to acquire additional storage and modernize projects. It could be a vehicle to achieve a more stable water supply for both agricultural and fishery resources. That change must be guided and directed by long-term interest for both resources to insure a successful outcome.

IRRIGATION PROFILE

Kennewick Irrigation District

By **Paul Chasco**
Manager
Kennewick Irrigation District

The Kennewick Irrigation District (KID) is a multifaceted irrigation district, rich in history and with roots deep in the development of the Yakma Valley. Started in the 1880s under different auspices, the project contributed to growth of the agricultural community in the Kennewick-Richland area. Settlers arrived with the hopes of planting orchards, vineyards and other commercially successful crops. The Kennewick Irrigation project, under a series of predecessors, played a crucial role in the satisfaction of the settlers' expectations.

The Kennewick Valley, located at the very end of the Yakima River System, receives five inches of precipitation annually. Because of this meager rainfall, homesteaders were slow to arrive in the region. With the establishment of the Northern Pacific Railroad in the 1880s and the settlement of the town of Pasco, the area began to develop.

Early irrigation efforts by settlers consisted of simple diversions for flood irrigation, small dams and gravity flow systems. KID's predecessor, Dell Haven Irrigation District, was formed in 1883. However, the Yakima Irrigation Improvement Company constructed the Main Canal (today known as the Columbia Irrigation District Canal).

The U.S. Reclamation Sevice first considered the Kennewick Irrigation District project (known as the Northern Pacific Irrigation Company) in 1905. However, it was not until 1917 that the District was actually formed to operate the existing system and seek funding to expand the project. KID provided irrigation water to orchards and settlements in the 8,000-acre project through the 1950s. It was during the early 1950s that the District received funds from the U.S. Bureau of Reclamation. This support allowed the District to undertake an ambitious expansion project which more than doubled the number of irrigable acres to its current size of 20,000 acres.

Within the past two decades, the Tri-Cities have undergone radical changes—from communities dominated by agricultural interests to the mushrooming urban centers. KID participated in the tranformation, becoming both an agricultural and urbanized irrigation system serving large farm/orchard developments, part-time gentleman farmers and urban/suburban residential developments. In converting surplus resources to financial stability, KID has developed a commercial/light industrial business park, a large residential mobile home development and aggressively participates in the economic advancement in the Kennewick-Richland area. Because of these adaptations to the surrounding environment, KID has not only survived but prospered. This prosperity is a result of tight fiscal management and active participation by the Board of Directors.

Today, KID is a thriving mixture of farms, ranches, orchards and residential developments. To service its 14,000 accounts, the District operates over 88 miles of open canals, 130 miles of pipelines, approximately 60 pumping stations and an assortment of automatic filtration systems, flow controllers and meter stations. To service these facilities, the District operates with a field and administrative staff of 21 individuals who are all responsible for the careful stewardship of the District's $1.5 million budget.

The increasing conversion of agricultural to residential land use has created a unique set of challenges for the District in meeting water delivery. The District has met these challenges by creating 87 local improvement districts representing over 7,000 residential lots. The local improvement districts, which are formed, financed, constructed and operated under the auspices of KID, provide on-demand, pressurized irrigation service at the turn of a tap. Through the District's five-year rotating master plan, canals are continually being enclosed in pipes or lined with the latest materials to improve utilization and conservation of District water. Outdated facilities are also being rehabilitated and new, more efficient facilities are being installed.

A District profile shows residential accounts make up 97% of all accounts, representing 45% of the District's land area. The farm accounts represent only 3% of the accounts but make up 55% of the land area.

The farming community, year after year, produces some of the Valley's best cherries, apples, pears, prunes, grapes, strawberries, hay and other crops. Last year, District farmers sold approximately $8 million in products. As the District service area and customers continue to diversify, KID will also diversify to meet the new demands and challenges of water delivery in the 80s and beyond.

CORRECTION

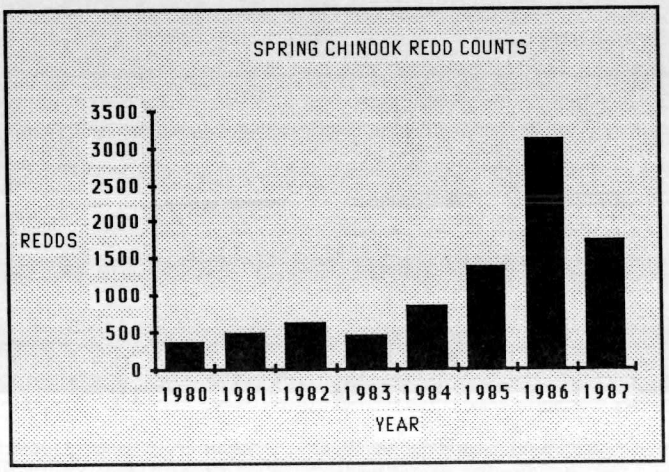
In the last issue of the Yakima Basin Resource News, the first part of Ron Van Gundy's "Profile of the Roza Irrigation District" was edited and published incorrectly. As printed, the reader might infer that the Roza District has grown in size to a present 100,000 acres. In fact, the Roza District has encompassed slightly over 100,000 acres, with no changes, since its inception. The additional irrigated acreage that has developed along the District's northern border has come from groundwater development.

Steelhead Run Static--

Spring Chinook Redd Count Down

Counting of adult steelhead returning to the Yakima Basin at the Prosser Dam fish counting facilities indicates that the '87-'88 run will number approximately the same as the '86-'87 run. Through February 11, adult steelhead numbering 1,846 had been counted as they passed Prosser Dam. This compares with 1,901 for the same date in 1987. The total adult steelhead count for the '86-'87 run was 2,483, while the '85-'86 run total was 2,208.

Meanwhile, the 1987 Yakima Basin spring chinook redd count was down from the 1986 count. This reduction was expected, as the returning 1987 adult spring chinook run continued to exhibit the impacts of the 1977 and 1979 water short years. The total Yakima Basin spring chinook redd count in 1987 was 1,740.



Another field activity that continues during the winter is the operation of the Chandler Canal juvenile trapping facility. This facility allows fisheries biologists to estimate the total outmigration of juvenile salmon and steelhead from the Yakima Basin during their travel to the sea. Although most juvenile salmon and steelhead outmigrate as smolts during the spring, a significant number move downriver during the fall and winter. Operation of the trapping facility during this time is essential if biologists are to gather needed data concerning the magnitude of this movement.

Over 50,000 juvenile chinook and steelhead were counted at the Chandler trapping facility from November 1987 through early February 1988. Operation of the facility has been greatly aided by generally mild winter weather that eliminated icing and other problems.

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